

U.S. Serial No. 10/759,645  
Response to Office Action  
Mailed August 21, 2006

Page 5 of 8

RECEIVED  
CENTRAL FAX CENTER

NOV 21 2006

**REMARKS**

Applicants have now had an opportunity to carefully consider the Examiner's comments set forth in the Office Action of August 21, 2006. In this response, Applicants have amended selected claims to provide a more complete scope of protection for the invention and present clarifying remarks believed to remedy the Examiner's rejections and place the claims in condition for allowance.

Reexamination and reconsideration of the application as amended are respectfully requested.

**I. Claim Rejections**

In the Office Action, the Examiner rejected claims 11-16 under 35 U.S.C. 103(a) as being obvious over U.S. Pat. App. Pub. No. 2004/0244879 to Tanaka et al.

With respect to claims 11-13, the Examiner asserts that Tanaka teaches, "...a tungsten alloy wire having 1-10% rhenium [abstract] and potassium [0024], said alloy having high tensile strength properties [0022] and large ductility after heat treating [0010], thereby providing a wire with excellent durability even when used at high temperatures." The Examiner further asserts that despite the fact that Tanaka does not teach a cold tensile strength (CTS) to hot tensile strength (HTS) ratio, Tanaka does teach "an overlapping composition, processed in a similar method of working and heat treating, then substantially the same properties, such as cold TS, hot TS, and ratio CTS/HTS, are expected to occur." (Detailed Action, pg. 2). Further still, the Examiner states that where the claimed and prior art products are substantially identical in structure that a prima facie case of either anticipation or obviousness is established and may be rebutted by evidence showing that the prior art product does not necessarily possess the characteristics of the claimed product.

Applicants respectfully disagree with the Examiner's assertion that the tungsten wire taught by Tanaka is substantially the same or has the same or identical properties as the tungsten wire of the present invention. For one, the annealing or strain removal process of Tanaka is performed at a temperature of 1200 to 2300°C with respect to a wire diameter of 100  $\mu\text{m}$  (¶ 0033 of Tanaka). By comparison, the

U.S. Serial No. 10/759,645  
Response to Office Action  
Mailed August 21, 2006

Page 6 of 8

tungsten wire of the present invention having a wire diameter of 0.3 - 0.04 mm is taught as being annealed between a temperature of 1100 to 1300°C (¶ 0025 of Nagy). The disclosure of the present invention teaches that the actual annealing temperature used depends on the wire diameter and that "wires with a larger diameter are annealed at a higher temperature, and thinner wires at a lower temperature" (¶ 0033). It should be noted that the wire diameter of Tanaka (100µm or .1 mm) is on the order of 3 times smaller than the wire diameter of the present invention (0.3 mm). As such, and consistent with the teachings of the present invention, less heat exposure or heat transfer is needed to achieve the equivalent amount of recrystallization during the annealing process for a smaller wire diameter. Therefore, if the wire of Tanaka and the wire of the present invention are both exposed to an annealing heat source of 1200°C, then the wire of Tanaka will be annealed to a greater extent than the wire of the present invention. This would affect not only the cold tensile strength (CTS) but also the hot tensile strength (HTS) of the wire. For at least this reason, it cannot be said that the wire of Tanaka and the wire of the present invention would be expected to have the same CTS, HTS, and CTS/HTS ratio.

Furthermore, in a preferred embodiment of the present invention, as indicated by Figure 5 and paragraph [0029], a final draw 22 is taught as being performed at a lower drawing speed than that of the preceding draw 21. In particular, the final draw speed may be 65% of the previous or initial draw speed (¶ 0029). In addition, having two different draw speeds may require the change over (as indicated by reference numeral 23) to a separate drawing line to avoid interruptions in a continuous production. No where does Tanaka teach or suggest a variable draw speed during the annealing process. As such, the draw speed is yet another factor that will also affect the overall extent of annealing and recrystallization of the tungsten alloy wire (therefore affecting CTS, HTS, and CTS/HTS ratio). Thus the tungsten wire of the present invention is further distinguished from that of Tanaka.

As to claim 14, the mandrel ratio is yet another distinguishing property of the finished tungsten wire product of present invention that is not taught or suggested by Tanaka. As taught by the disclosure of the present invention, the smaller the mandrel ratio the better the light output and efficiency (¶ 0003). Naturally, due to material strength and ductility constraints, achieving a smaller mandrel ratio is

U.S. Serial No. 10/759,645  
Response to Office Action  
Mailed August 21, 2006

Page 7 of 8

particularly challenging as it is at least partially dependent on the CTS/HTS ratio of the wire. As taught by the instant case, a mandrel ratio up to a value of 2 is possible given the CTS/HTS ratio characteristics that are obtainable by using the unique annealing technique taught by the present invention. For this reason, the mandrel ratio characteristic of the coil shown by Fig. 9 of Tanaka cannot be said to be substantially the same as that being claimed herein and is therefore not obvious in view of Tanaka.

With respect to claims 15 and 16, since claim 11 is not obvious in view of Tanaka, similarly claims 15 and 16 are not obvious and are therefore allowable since they depend directly upon claim 11. Also, with reference to claim 16, Tanaka does not teach or suggest the use of any of the additives (except for rhenium - Re) which are listed in claim 16, such as Th, ThO, YO, LaO, and CeO.

Lastly, it should be noted that clarifying language has been added to claim 11 and that new claims 17 and 18 have been included to further distinguish the present invention from the prior art and each finds proper support from the specification in paragraphs [0025] through [0029].

Applicants respectfully submit that the present Amendment and the claims as amended do not raise any issues with regard to new matter and place the application into better condition for allowance. Early notice to that effect is solicited.

U.S. Serial No. 10/759,645  
Response to Office Action  
Mailed August 21, 2006

RECEIVED  
CENTRAL FAX CENTER  
NOV 21 2006

Page 8 of 8

**CONCLUSION**

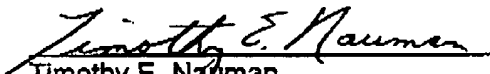
All formal and informal matters have been addressed. For the reasons detailed above, it is respectfully submitted all claims remaining in the application are now in condition for allowance.

No additional fee is believed to be required for this Amendment, however, if an additional fee is due, the Commissioner is authorized to charge our Deposit Account No. 06-0308.

Respectfully submitted,

FAY, SHARPE, FAGAN,  
MINNICH & McKEE, LLP

Date: 21 Nov 2006

  
Timothy E. Nauman  
Reg. No. 32,283  
1100 Superior Avenue, 7th Floor  
Cleveland, Ohio 44114-2579  
(216) 861-5582 (phone)  
(216) 241-1666 (facsimile)

N:\GEC\200696\APT0000152V001.doc